

Charge transport in polyaniline heavily doped with p-toluenesulfonic acid

Krinichnyi V., Tokarev S.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

First results of a 3-cm (9.7 GHz) and 2-mm (140 GHz) waveband EPR study of the magnetic and electron-transport properties over a wide temperature range are reported for the crystalline phase of polyaniline highly doped with p-toluenesulfonic acid. The nature of charge carriers was analyzed and the mechanism of charge transport was established. The spin-lattice and spin-spin relaxation times were measured using the continuous saturation technique. Quasi-three-dimensional (Q3D) domains with a high conductivity are formed in polyaniline by doping. The effective electric conductivity of the polymer is determined by Mott Q3D hopping in domains of this type and Q1D variable-range hopping between these domains. There is no correlation between charge transport and spin relaxation processes. Copyright © 2005 by Pleiades Publishing, Inc.
